



# Online Grammar Checker for Syntactic Error Detection and Correction in English Writing

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**APA Citation:**

Noobutra, C. (2024). Online grammar checker for syntactic error detection and correction in English writing. *LEARN Journal: Language Education and Acquisition Research Network*, 17(2), 487-510.

Received  
21/03/2024

Received in  
revised form  
15/05/2024

Accepted  
31/05/2024

**ABSTRACT**

The present study investigates whether or not Thai students' English writing skills can be improved by using an online grammar checker. First, typical syntactic errors made by undergraduate students majoring in English and English for Careers were examined. Secondly, possible reasons for syntactic errors in English writing in the light of Lado's (1957) CAH and Corder's (1967) EA are explored. Thirdly, it is determined if the number of syntactic errors can be reduced when an online grammar checker is used. Sixty participants were selected employing purposive sampling from students majoring in English and English for Careers. Two sets of test papers were used as the research tool, and errors were analysed before and after the use of an online grammar checker. A comparison of errors made in the two phases could then be used to assess the effectiveness of the online grammar checker. Spelling errors were found to be the most common errors in the present study. The next three most common errors involved capitalisation, verb forms and fragments. All of the students' errors were caused by L1 transfer, and are referred to as interlingual errors. The findings support the notion that interlingual errors, as predicted by Lado's (1957) CAH, are the predominant cause of inaccuracies. Meanwhile, English for

	<p>Careers students made fewer syntactic errors in Phase 2 after learning how to use an online grammar checker to identify and correct syntactic errors, whereas those majoring in English made more errors overall.</p> <p><b>Keywords:</b> syntactic errors, Thai learners of English, online grammar checker, English writing</p>
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## Introduction

In an era of technological advances and convenient electronic gadgets such as smartphones and tablets, education which is accessible, mobile, and flexible has become possible (Yadav, 2020). The application of software such as online dictionaries and grammar checkers can now be used to facilitate better English writing. For example, word processing software can help students to produce error-free assignments, since writing and typing errors can be simply fixed by right-clicking. As suggested by Jayavalan and Razali (2018), the use of computers in education has had a significant impact, especially in teaching a second language (L2). Furthermore, Hicham and Bachir (2020) assert that checking spelling and grammar with a dictionary is now standard practice. However, given the prevalence of mobile phones and advances in computer technology, it is unsurprising that contemporary software provides functions such as autocorrect, spelling suggestions, and even guidance on word formation. It is difficult to find anyone who has not used this modern technology, whether for academic papers, Facebook chat, email correspondence, or essay writing. However, despite the pervasiveness of technology in contemporary society, university students are prohibited from utilising technology in the classroom. Instead, students must employ conventional writing tools, such as pen and paper, to compose and produce texts for their examinations and assignments. The aim of the present study is to investigate if the use of online grammar checkers by learners has a positive effect on their English writing.

## Literature Review

### The Contrastive Analysis Hypothesis (CAH) and Error Analysis (EA)

Several factors can influence errors made when learning an L2. The present study employs two approaches to examine writing errors: Lado's (1957) CAH and Corder's (1967) EA. According to the CAH, transfer errors occur when learning an L2 due to the influence of the learner's mother

tongue. EA represents another tool employed to identify potential reasons for errors in written English, where its focus is on the L2 itself. It is deemed inevitable that students will make errors, and these considered an essential element of the learning process since errors provide opportunities for the acquisition of knowledge. Consequently, the occurrence of errors may be indicative of the extent to which students are learning. Teachers can then utilise EA to assist students in solving problems, as it seeks to identify the knowledge and skills that students have acquired and those that they have yet to master.

## **Errors and Their Sources in the English Writing of Non-native Students**

According to Corder (1973, p. 260) errors are “those features of the learner’s utterances which differ from those of any native speaker”. Corder (1967, p. 166) distinguished between two categories of errors, which may be systematic or non-systematic. A learner’s systematic errors “reveal his underlying knowledge of the language to date”, thereby demonstrating his competency. Errors made by ESL/EFL learners are of significant consequence, as “they provide to the researcher evidence of how language is learned or acquired, [and] what strategies or procedures the learner is employing in the discovery of the language” (Corder 1967, p. 167).

Writing is an important yet challenging skill, and previous studies have investigated the common errors students make while learning English as an L2. Although learners of English frequently make several types of error in their writing, two of the most common found in previous studies are those involving prepositions and verb tense, and the major source of errors is transfer from the mother tongue. According to Hafiz *et al.* (2018), Arabic learners of English writing were most likely to face problems with copulas, subject-verb agreement, tense, to infinitive, articles, prepositions, and conjunctions, which mainly resulted from language transfer. It is therefore recommended that, if traditional methods for teaching writing might not be effective, other ways should be found to attract the learners’ attention to and interest in writing. Adopting Ellis’s (1997) EA method of error identification, categorisation, analysis, and explanation, the types of error found by Atmaca (2016) in the writing of Turkish EFL learners involved prepositions, verbs and tenses, articles, sentence structure, punctuation, gerunds, plurals, possessives, and word choice. The errors found were classified in ten categories, with errors relating to possessives and gerunds having the lowest frequency and the omission of prepositions being the most frequent. The majority of errors made by low-level language learners were interlingual errors. These learners tended to transfer structures from their native language

to the target language and to over-generalise rules in the target language. Darus and Ching (2009) examined the writing errors of Chinese students, and the most frequent mistakes were found to relate to the mechanics of writing, including tense, the use of prepositions, and subject-verb agreement. The errors observed could be attributed to first language (L1) interference and a lack of comprehension of English grammar norms.

## Errors and Their Sources in the English Writing of Thai Students

Previous research has indicated that punctuation errors are the most prevalent type made by Thai learners in written English, mainly caused by transfer from their L1. Pappol *et al.* (2022) used an essay-writing test to investigate writing errors made by students and the causes of their mistakes. The results showed that the most common errors were in punctuation, articles, verb tense, and word choice. Transfer from the participants' mother tongue to the target language was the main cause of errors. Students had difficulty distinguishing between simple and complex sentences, and different sentence structures. Therefore, they found it difficult to produce complete sentences with correct articles and punctuation. Waelateh *et al.* (2019) examined English writing errors made by students learning Thai as L2, Arabic as L1, and English as a foreign language (EFL). Problems with spelling, punctuation, and loanwords were the most common types of syntactic errors made. The influence of the learners' L1 Arabic and their inadequate mastery of the English language were the main causes of the syntactic problems. In a study conducted by Sermsook *et al.* (2017), the causes of errors made in the written English of students were investigated. The most common errors found were related to punctuation, articles, subject-verb agreement, spelling, capitalisation, and fragments. The errors can be attributed to three main causes: interlingual or intralingual interference, lack of familiarity with English grammar and vocabulary, and carelessness. Additionally, negative transfer from the L1 was found to be the primary factor contributing to these errors. Khumphee (2005) analysed the types and frequency of grammatical errors made by undergraduates, and investigated whether or not L1 interference had any impact on the errors. It was found that the most common errors in English essays were related to punctuation, nouns, prepositions, verbs, and articles. In addition, thirteen distinct types of interlingual errors were identified, with the most frequent being related to plural noun forms, punctuation, improper sentence structure, missing phrase elements, and fragments.

Additionally, errors in the use of singular and plural nouns as well as in subject-verb agreement were observed. These errors were caused by the transfer of linguistic knowledge from the L1 to the L2. Kampookaew (2020)

investigated errors in essays written by students. The most common errors related to subject-verb disagreement, singular and plural nouns, and the article 'the'. These grammatical errors may not have completely obscured the meaning of their writing, but the errors were frequent enough to significantly lower the quality of the work and to disqualify it from publication. The sources of error were identified as both interlingual and intralingual. Bunjantr (2018) examined the causes of syntactic errors made by students when writing in English. The most frequent errors made by students involved determiners, singular and plural nouns, incomplete structures, and prepositions. The main cause was the influence of the mother tongue, which included verbatim translations, the use of Thai structures in English writing, and the use of adjectives as main verbs. Promsupa *et al.* (2017) assessed the writing of undergraduate students. The two main types of mistakes found were morphological and syntactic errors. The most common errors were related to singular/plural, articles, and prepositions which were caused by both intralingual and interlanguage factors. Phetdannuea & Ngonkum (2016) conducted a study of the errors made by students majoring in English. They found that interlingual errors were more frequent than intralingual errors. The most common errors related to interlingual factors were subject-verb agreement, run-on sentences, and determiner-noun agreement. The student essays contained all four categories of intralingual errors: over-generalisation such as the overuse of punctuation, inadequate application of rules such as the omission of punctuation, ignorance of rule restrictions such as in incorrect word choice, and false concept hypothesis such as splitting. This shows that, since interlingual errors related to L1 transfer were the cause of most errors, teachers are advised to focus on the differences between the L1 Thai and L2 English in grammar and sentence structure. This may help to heighten the awareness of the L2 learners so that they would be more careful when writing in English.

Yordchim and Gibbs (2014) conducted research to identify errors made by university students when completing a test paper. The results revealed that the highest percentage of inflectional errors related to nouns, followed by adjectives and verbs. The acquisition of an L2 is facilitated by positive transfer, which occurs when the structures of the L1 and the L2 are similar. Conversely, negative transfer occurs when the differences in features or structures between the two languages act as an obstacle to the acquisition of the L2. Inflectional morphology has been identified as a challenging area for L2 English learners. The Thai language does not have inflection, meaning that there are no specific forms for plural nouns, present/past participles of variable verbs, or comparative and superlative adjectives. The acquisition of an inflectional language is challenging for Thai students as they are not accustomed to inflected nouns, verbs, and adjectives. Kaweera (2013) aimed

to identify errors in the writing of EFL students and their sources by examining the theoretical concepts of interlingual interference from the mother tongue and intralingual interference. It was found that intralingual and interlingual errors were the two primary sources of writing errors. Some restrictions of the language transfer process are overlooked by learners. Due to the substantial structural differences between the learners' L1 and L2, many errors in the target language were found, particularly those resulting from interference from the native language in terms of lexicon, syntax, and discourse. Although the writers may have understood the meaning of the reading passage, they were unable to apply the target language vocabulary, grammar rules, and spelling when writing.

By teaching students about the causes of errors, it may be possible to help them understand that, despite the fact that errors are not always seen favourably and can occasionally impede communication, they can in fact be beneficial to students learning a foreign language. Teachers can recognise and categorise the errors made, and they can teach students about the process of learning the target language. It is evident that errors made by writers in EFL can be regarded as a valuable source of insight into the methods and techniques employed by language learners in their language acquisition. Language learners may need to comprehend, memorise, and practice specific rules, which can be complex and often involve exceptions.

## **Online Language Learning by Non-native Students**

Some studies have focused on strategies in addition to conventional teaching approaches that might help improve students' English writing. For example, researchers have examined the advantages and disadvantages and effectiveness of online grammar checkers. Anggita et al. (2023) investigated their benefits and drawbacks in assisting non-native students to evaluate the quality of their work while learning a language online. The study employed a library research methodology to examine 14 papers. The results demonstrated the effectiveness of online grammar checkers in aiding learners to learn the language independently. Various shortcomings of these tools were identified, such as their inability to detect certain problems or the requirement to purchase premium editions in order to access additional features. Therefore, it is unlikely that online grammar checkers could replace teachers in terms of providing feedback, particularly for users of the free versions due to the limitations of the applications. Long (2022) compared the effectiveness of the online grammar checking software Grammarly and self-editing techniques. The study found no significant differences between the two methods although certain grammatical problems could be detected using the online resources. This author concluded that online grammar checkers

could be a useful instructional tool for less proficient L2 learners. However, teachers and EFL students still need to work together in editing and proofreading so as to improve the learners' skill levels.

The effectiveness of Grammarly in assisting students with their English narrative writing was investigated by Jayavalan and Razali (2018). The results showed that the grammar checker helped the students in the experimental group to adhere to the rules of correct sentence structure, punctuation, spelling, and subject-verb agreement. The authors suggested that more research on grammar checkers should be conducted as these tools could help students accomplish a transition from traditional classroom teaching to more autonomous, self-directed learning. Hadiat et al. (2022) tested the use of Grammarly by students to improve their descriptive texts and evaluated the participants' opinions on the software. The results indicated that Grammarly could enhance the accuracy of descriptive writing. It improved the students' writing skills, made it easier to detect errors, prevented plagiarism, encouraged them to be more thorough when correcting errors, and boosted their confidence in writing. Boonsirijarungradh (2021) investigated the effects of the use of a grammar checker program on the writing of Thai learners of English. Ginger software was used and the errors made were analysed before and after its use. It was found that the participants' writing contained fewer grammatical errors after learning to use the grammar checker.

Existing research has found that English language learners struggle with writing, particularly in relation to singular/plural nouns, subject-verb agreement, spelling, punctuation, articles, and discourse conventions. Moreover, errors in English writing are caused by both intralingual and interlingual factors, with L1 transfer playing a more crucial role. Furthermore, it has been found that the use of grammar checkers can improve learners' English writing. In addition, as indicated by Perdana and Farida (2019), the utilisation of computer technology to enhance writing is becoming increasingly inevitable nowadays. Many software tools provide both paid and free options for access to various services. In the present study, a free version of an online grammar checker is used to examine whether its implementation can facilitate improvements in students' English writing. The present study addresses the following three research questions:

1. What are the syntactic errors in English writing?
2. What are the possible causes of syntactic errors in English writing?
3. Do students make fewer errors after learning to detect and correct errors from an online grammar checker?

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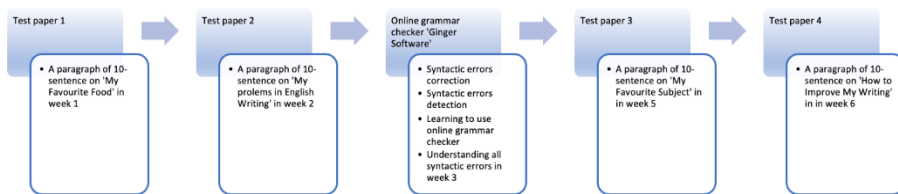
## Methodology

The 60 participants in the present study were students at a university in the south of Thailand. A purposive convenience sampling strategy was employed to select participants. In order to be considered eligible for inclusion, participants were required to meet two specific criteria. Firstly, they were in English and English for Careers majors. Secondly, the students in English major took English Essay Writing course, and those in English for Careers took Writing English for Specific Purposes course in the academic year 2/2023. The participants were informed that their involvement in the present study would have no impact on their course grades or scores, and that all personal information would remain confidential. They had full discretion to decide whether or not to participate. If they agreed to participate, they signed a consent form.

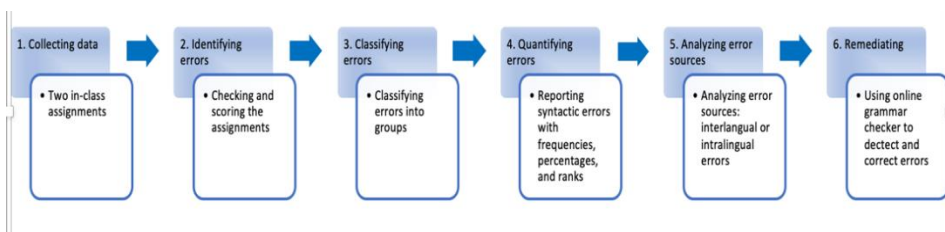
Regarding the research instruments as shown in Figure 1.1, two phases were investigated: Phase 1 (from test papers 1 and 2 on 'My favourite food' and 'My problems in English writing') and Phase 2 (from test papers 3 and 4 on 'My favourite subject' and 'How to improve my writing'). The four test papers for descriptive writing addressed a range of topics, and their objective was to challenge students to demonstrate their ability to write effectively on a variety of subjects. A variety of subjects forced the students to write naturally and not to recall anything from examples in class. Students possibly recalled writing from previous tests if the test papers were on the similar topic which possibly did not accurately reflect their writing ability in English. However, it was anticipated that students would find it simple to write texts on these four topics which were relevant to their everyday lives. They were not expected to require a significant amount of time to reflect and prepare before writing, since they would already be well-versed in the subject matter.

Item objective congruence (IOC) analysis was used to verify the reliability of the test paper research instrument. Three English teachers approved the IOC, which had a value of 0.98, to confirm the reliability and validity. Each test paper involved the writing of 10 sentences, with a time limit for completion of 60 minutes. The test papers were completed in two phases in order to assess errors made before and after the use of an online grammar checker to detect and correct mistakes in order to provide an indication of this tool's effectiveness if there are fewer errors in English writing after its use.



**Figure 1***Research Instrument*

Each student had to complete four test papers on different topics in class, giving a total of 40 sentences. Test papers 1 and 2 were completed in weeks 1 and 2 respectively before the students learned how to use an online grammar checker. As in Boonsirijarungradh's (2021) study, the students then learned to use the free version of the online grammar checker programme Ginger. Perdana and Farida (2019) describe Ginger as a grammar tool that provides expedited proofreading services to correct a variety of grammatical errors, including those pertaining to subject-verb agreement, singular/plural nouns, consecutive nouns, misused words, and spelling. It recommends sentence forms and assists in determining which modifications best preserve the original text's meaning. Furthermore, it is possible to integrate this tool with other applications, enabling users to utilise it in, for example, Gmail, Facebook, Twitter, and LinkedIn software. Test papers 3 and 4 were then completed in weeks 5 and 6 respectively, to allow an evaluation of any improvements in the English writing after the use of the online grammar checker. The analysis of errors involved six steps, as shown in Figure 1.2.

**Figure 2***Steps of Error Analysis (Gass et al., 2013)*

The sentences containing errors were then identified and categorised in terms of different error types in order to answer research question 1. An

error classification scheme was used to assign error codes, such as ‘1’ for article errors and ‘2’ for capitalisation errors. This scheme was modified from that used by Dulay *et al.* (1982), Norrish (1983), and Srinon (1999), taking into account the features of each error type. To determine the frequency of each type of error, each instance was taken into account since any sentence might contain more than one error. The assigned errors made by each participant in each sentence were limited to the most common types of errors. For instance, student EN1 made three errors each in relation to articles and capitalisation, five errors in fragments, and two errors in punctuation. Therefore, the most common error type for this student was fragments. To determine if all students made errors at the same rate, each student had to write an additional ten sentences. The investigation in the present study employed Bunjantr’s (2018) categorisation of syntactic errors, Waelateh *et al.*’s (2019) analysis of errors in writing, and Kampookaew’s (2020) classification of grammatical errors into three categories.

To assess the effectiveness of the online grammar checker in detecting and correcting errors, a mixed logistic regression analysis was conducted for the binary variable ‘no errors’ or ‘with errors’. If the percentage of ‘no errors’ increased in Phase 2, this would suggest that the use of an online grammar checker was effective. Additionally, as also noted by Kampookaew (2020), the present study used Norrish’s (1983) approach described as “Let the errors determine the categories”, which means that it allows all errors themselves to determine the categories chosen. For instance, Phoocharoensil *et al.* (2016) identified all types of grammatical errors made in the compositions of student writers and classified them into primary groups. In this way, although the present study focused on syntactic errors, which was the main concern, other possible writing errors such as mechanical errors of spelling and capitalisation together with morphosyntactic errors made by the participants were also considered.

The potential theoretical impact of Lado’s (1957) CAH and Corder’s (1967) EAH on the English writing proficiency of Thai undergraduate students was examined in research question 2. The errors detected were categorised as either intralingual or interlingual errors. Research question 3 was used to investigate the effectiveness of the online grammar checker in improving the students’ writing. Brown *et al.* (2008) suggested that a three- to six-week interval between tests could improve the validity of the results, and so test papers 3 and 4 were administered three and four weeks respectively after the completion of Test paper 2.

Multiple coders were used to analyse the same data in order to improve the reliability of the research findings. To achieve this, two additional English lecturers as well as the researcher assessed the errors. Each of the three coders reviewed the writing samples word by word, noting every

inaccuracy in an error record form according to the type of error. Each piece of writing was analysed three times during separate checking sessions to ensure the consistency of the results. To guarantee the validity and reliability of the analysis, errors were checked a second time two weeks after the initial examination of the writing to ensure accuracy in the absence of previous findings. If two of the three checkers recorded the same result, this was considered to be definitive. Pseudonyms were used during the transcription process, and data anonymisation was implemented during the analysis.

The frequencies of all error types were converted into percentages in the fourth step of the error quantification process. Using R Studio software (Bates et al., 2014), the types of errors are provided as rankings, percentages, and frequencies. The different error types were examined in the fifth step of the error analysis in order to determine the possible causes of the errors. Each error was categorised as either intralingual or interlingual, following Richards (1974). Errors of prepositions, pronouns and singular/plural words were categorised as interlingual errors in the present study, whereas errors of false analogy irregular plural, false analogy irregular verbs, over-generalisation, misanalysis, incomplete rule application, exploiting redundancy, overlooking co-occurrence restrictions, and hypercorrection were associated with intralingual errors.

In the sixth step of remediation, students were taught how to use the Ginger online grammar checker to detect and correct errors in Weeks 3 and 4. In this way, the students could learn about their most common errors from both Ginger and their teacher. The students went through each sentence on their test papers and entered each of their erroneous sentences as input to Ginger, which flagged sentences that were not correct so that they could view their errors. Ginger also offered alternatives to correct the errors. Having accepted the proposal, an output sentence was then received. The teachers subsequently conducted a second review to ascertain if the software had correctly identified and rectified the errors.

## Results

The findings for the errors found are presented as percentages in Table 1.1 in descending order of frequency. To answer research question 1, 2400 sentences from the four test papers were analysed, 1440 of which were produced by English majors and 960 by English for Careers majors produced 960 sentences. With rates of 27.78% and 45.83% respectively for English and English for Careers students, spelling errors were the most common type. Article errors represented 2.78% of errors made by English majors but this type was not made by English for Careers students. Capitalisation errors were

the second most common type, representing 16.67% of all errors made by English majors, while capitalisation, fragments and prepositions are the second most common errors made by English for Careers students, selected at the rate of 12.5%.

**Table 1**

*Errors according to Majors*

Errors	Major	
	English	English for Careers
Spelling (N)	27.78% (200)	45.83% (220)
Capitalisation (N)	16.67% (120)	12.5% (60)
Fragment (N)	8.33% (60)	12.5% (60)
Verb form (N)	8.33% (60)	8.33% (40)
Subject-verb agreement (N)	8.33% (60)	4.17% (20)
Preposition (N)	5.56% (40)	12.5% (60)
Conjunction (N)	5.56% (40)	
Misplacement of adjective (N)	5.56% (40)	
Singular/plural (N)	5.56% (40)	
Punctuation (N)	2.78% (20)	4.17% (20)
Article (N)	2.78% (20)	
Pronoun (N)	2.78% (20)	

Examples of sentences containing spelling and other errors are presented below.

*because my father part away when I was a 2 years old. but I don't have my prarent*  
(Student EN13)

*I don't leve with family.* (Student EN25)

*I live with my parents in Suratthani, befor I study in university.* (Student EN25)

*I don't understan about gramma.* (Student ENC18)

*I nevor always wnen I writeing in english.* (Student ENC3)

*I problems about 12 tens, because I don't understant.* (Student ENC27)

The results of the study correspond to the findings of Khan and Akter (2011) that spelling errors were most common among Bangladeshi students. Similarly, Darus and Ching (2009) found that one of the top four most common errors was mechanical. According to Waelateh *et al.* (2019), spelling errors had the highest token count of all errors. Similarly, Sermsook *et al.* (2017) showed that errors in punctuation, articles, subject-verb agreement, spelling, capitalisation and fragments were most frequent.

The research question 2 asks whether errors in English writing are caused by L1 transfer alone, as predicted by Lado's (1957) CAH, or relate to the L2 itself, as suggested by Corder's (1967) EA. The definitions given by Richards (1974) of the causes of intralingual and interlingual error are also adopted. Table 1.2 shows that the errors made by students from both majors cannot be attributed to the nature of the L2 alone. Thus, L1 transfer is the cause of 100% of the errors in both groups.

**Table 2**

*Sources of Errors according to Majors*

Interlingual/intralingual errors	Major	
	English	English for Careers
Interlingual errors (N)	100% (1440)	100% (960)

Thirteen types of interlingual errors were found in Khumphee's (2015) study, the most common of which involved plural noun forms, punctuation omissions, inappropriate sentence structures, and fragments. According to Sermsook *et al.* (2017), interlingual interference is the main reason for errors, and Kaweera (2013), Phetdannuea and Ngonkum (2016), Waelateh *et al.* (2019), and Pappol *et al.* (2022) concluded that students in Thailand now have a better knowledge of errors in English writing. The use of adjectives as primary verbs, literal translation, and mother tongue interference are the main causes. Waelateh *et al.* (2019) concluded that the main reasons for syntactic errors were inadequate knowledge of English and the influence of L1 Arabic, while Phetdannuea and Ngonkum (2016) found that intralingual errors were less frequent than interlingual errors. These

studies thus support the idea that interlingual transfer can explain the errors made in learners' English writing, as in the present study. The studies that provide evidence of errors originating from both intralingual and interlingual factors therefore contradict the findings of the present study.

To address research question 2, interlingual errors in relation to Lado's (1957) CAH have a greater impact on the causes of errors in the English writing of the English and English for Careers students. According to Lado's (1957) CAH, positive transfer occurs when there are linguistic similarities between the learner's L1 and the L2 they are trying to acquire. On the other hand, negative transfer occurs when the learner's L1 patterns differ from the L2 patterns. It can be recommended that teachers should concentrate on the differences between the grammar and sentence structure of L1 Thai and L2 English, since the errors made were due to interlingual factors related to L1 transfer. The objective is to help L2 learners become more conscious of the distinctions between the two languages, which would then enable them to exercise greater caution when writing in English. Also, errors serve as feedback for teachers of writing concerning how successful their pedagogical approach is.

Research question 3 examines the effectiveness of an online grammar checker in detecting and correcting syntactic errors, by comparing the frequencies of sentences written with no errors in Phase 1 and 2. Following the use of an online grammar checker as well as instruction on the various errors that can occur in English writing, students in both majors show to different extents how useful online grammar checkers are, as shown in Table 1.3. The proportion of English majors making no errors is lower in Phase 2 (at 35.71%) compared to in Phase 1 (64.29%). This suggests that the grammar checker did not help them to write better in English. Conversely, the proportion of English for Careers students making no errors in Phase 2 (45.32%) was slightly higher than that in Phase 1 (54.68%), showing that learning to use the online grammar checker enables these students to enhance their English writing skills by highlighting sentences that lacked proper grammar. This might subsequently facilitate more accurate writing in the future by preventing the repetition of these errors.

**Table 3**

*Frequency of No Errors according to Phases and Majors*

Writing assignment	Major	
	English	English for Careers
Phase 1	64.29%	45.32%

Phase 2	35.71%	54.68%
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Based on the results of the generalised mixed effects logistic regression, the model shows that Phase 1 and 2 form the two rows of coefficients in the independent variable Phase, in Table 1.4. The row containing Phase 1 is hidden as it acts as the baseline or reference level for this predictor. Changes in the independent variable have an impact on changes in the dependent variable, which can be either ‘no errors’ or ‘with errors’, if the p-value is less than 0.001. In this case, a p-value of less than 0.001 indicates that the observed difference is not the product of chance, suggesting that the variable predictor of the phase regulates the use of ‘no errors’ or ‘with errors’. Looking at each student individually, the p-value of less than 0.001 indicates that the effect of Phase 2 was significantly different from that of Phase 1 in the baseline. Therefore, effect of Phase 2 showed a tendency to use ‘with errors’ with an estimate of 0.44779.

**Table 4**

*The Best Model including Number of Sentences (N). Positive values reflect more ‘with errors’; negative numbers more ‘no errors’. Random effects of the student (SD = 0.6112). AIC = 2862.1.*

	Estimate	Std. Error	z value	Pr(>  z )	N
(Intercept)	0.60679	0.12592	4.819	≤ 0.001 ***	
<b>Phase</b>					
Phase 1					1200
Phase 2	0.44779	0.09224	4.855	≤ 0.001 ***	1200

Consequently, without dividing the participants into two majors but considering all students in the best model, the above findings differ from those reported by Hadiat et al. (2022) that the use of Grammarly improved the accuracy of descriptive writing. After using a grammar checker, participants in Boonsirijarungradh’s (2021) study produced fewer grammatical errors in their English writing, and Jayavalan and Razali (2018) also showed that a grammar checker helped students to improve their narrative writing. On the other hand, most of the conclusions of the present study are consistent with the study of Anggita *et al.* (2023) which was library research examined the advantages and disadvantages of using online grammar checkers. It discovered weaknesses such as their inability to detect specific errors or the need to purchase premium editions for additional capabilities.

Perdana and Farida (2019) posit that Ginger offers two distinct subscription options: basic and regular. However, utilising a basic subscription precludes users from accessing the essential features, as asserted by TopTenReviews.com. Therefore, it is strongly recommended that users opt for a regular subscription to enjoy the full range of services. The feedback is provided in the form of alternative texts with text colouring, which helps to detect errors and provide corrections if the free check is the only method employed. In Sahu *et al.* (2020), Ginger and After the Deadline Software did not correct even a single error of sentence structure. Chui (2022) reports that QuillBot performed the best in terms of error detection at the sentence level, while Ginger had the greatest number of errors that were undetected. The software consistently failed to detect errors that were readily apparent. Among the three free AI grammar checkers, in terms of the number of unflagged errors, QuillBot generally performs the best, with Ginger performing the worst. McCarthy *et al.* (2019) also found that, although the availability of spelling and grammar checking helped to improve certain components of essay quality, other aspects of the writing remained the same. Furthermore, these methods had little effect on the scores of the essays. There were no significant benefits to spelling and grammar correction in terms of sentence structure, unity, body quality, and introduction quality.

The percentages of the same types of errors made by students in both majors in Phase 1 and 2 are shown in Table 1.5. It can be seen that some students consistently made spelling and capitalisation errors in their writing, accounting for 25% of all errors in both phases. It is possible that these errors are more challenging than other structures because more students make them than other errors. Two students have errors of the fragments at the rate of 50%. Each verb form and subject-verb agreement error is produced 100% identically by each student. It is thus possible that students may not have benefited from the use of an online grammar checker to identify and repair errors in their English writing if they have made the same errors in Phase 1 and 2.

**Table 5**

*Frequency of the Same Types of Errors Made according to Phases and Students*

Student	The same types of error made in Phase 1 and 2				
	Spelling	Subject-verb agreement	Verb form	Capitalisation	Fragment
EN1 (N)					50% (40)
EN11 (N)			100% (40)		



Student	The same types of error made in Phase 1 and 2				
	Spelling	Subject-verb agreement	Verb form	Capitalisation	Fragment
EN13 (N)	25% (40)				
EN21 (N)				25% (40)	
EN26 (N)				25% (40)	
EN36 (N)				25% (40)	
ENC1 (N)				25% (40)	
ENC10 (N)		100% (40)			
ENC15 (N)	25% (40)				
ENC21 (N)	25% (40)				
ENC3 (N)	25% (40)				
ENC5 (N)					50% (40)

## Discussion and Conclusion

Generally, spelling errors were the most prevalent type of mistake in the writing produced by both the English and English for Careers students. To address research question 1, the present study examines the most common errors made by L2 English language learners. The poor spelling found in Pongsukvajchakul's (2022) study was said to demonstrate a lack of attention to detail and inadequate writing skills. According to Naruemon (2012), a total of 143 spelling errors were identified in the twenty papers that were examined. The majority of learners' spelling errors were caused by mispronunciation, homophony, the association of certain sounds with simple, common words, differences between the English and Thai writing systems, differences between Thai and English in the correspondence between graphemes and phonemes, carelessness and confusion, the 'silent' final in English, and an oversimplification of English spelling rules. The differences between the writing systems of English and Thai as observed in Naruemon's (2012) study may be comparable to the theoretical framework of Lado's (1957) CAH, which is employed in this investigation. Waelateh *et al.* (2019) suggest that the fact that students submitted handwritten work without the use of autocorrect software may be another factor contributing to the prevalence of spelling errors. As a result of their familiarity with the

computer's autocorrect feature, learners may be less inclined to rely on themselves in the context of writing and detecting possible spelling errors.

Regarding research question 2, it was found that intralingual factors, which are emphasized in Corder's (1967) EA, did not contribute to any of the errors in this study. All of the errors were attributed to interlingual factors, in accordance with Lado's (1957) CAH. Thus, although L1 Thai and L2 English share a similar structure for SVO, other patterns of these two languages differ in other respects. According to Lado's (1957) CAH, structural differences between languages make them more difficult to learn whereas similarities aid language acquisition. The errors made by learners in L2 acquisition may be based on the differences in the grammatical structures of the L1 and L2. For example, the use of capital letters and articles can be challenging for the learners, since they are not present in the Thai language. Due to the differences between English, an inflectional language, and Thai, an isolating language, L1 Thai learners may face difficulties in acquiring L2 English structures. Yordchim and Gibbs (2014) support the idea that Thai learners may struggle with learning how to change noun or verb forms in English due to the lack of inflection in their native language. As a result, constructing sentences with the correct grammatical structure, such as using the correct tense or singular/plural forms, may be difficult for Thai students even though the sentences will still contain a subject, verb, and object. Given that interlingual factors contribute to the errors found in the present study, differences between Thai and English patterns such as subject-verb agreement, singular/plural nouns, or tenses may be the cause of the errors in English writing. As the students use their L1 Thai knowledge to help in their L2 English writing, negative transfer from L1 probably plays a role in their English writing.

Research question 3 focuses on how well an online grammar checker can detect and correct syntactic problems. The results show that using an online grammar checker and being aware of syntactic problems can help English for Careers students to write more accurately. However, the results presented in Table 1.4 show that, when all students are considered, participants tend to report more 'with errors' than 'no errors'. The findings of this study contradict those of previous research by Jayavalan and Razali (2018), Boonsirijarungradh (2021), and Hadiat *et al.* (2022), which concluded that online grammar checkers improve the accuracy of English writing. In fact, the use of an online grammar checker to detect and correct syntactic errors did not lead to improved writing accuracy among the English major participants in the present study. In addition, Anggita *et al.* (2023) have highlighted some of the limitations of these online tools, and thus it is difficult to claim that online grammar checkers can replace teachers in providing feedback. Long (2022) found no significant differences between the two

editing techniques, although the work produced by those who used online grammar checkers was different. McCarthy *et al.* (2019: 279) suggested that the availability of online writing tools may change the dynamics of the writing process. If students can rely on such tools to make their work easier, they may write more effectively. However, learners should not overly rely on computer programmes to correct errors, since they still have to write by hand without the use of computer technology when completing tests in class. The present study's findings suggest that students may perceive the conventional written feedback method as more significant and necessary than using an online grammar checker when writing in English. It is possible that students are less comfortable using online grammar checkers for self-learning than they are with the traditional method of teacher grading. Teachers should pay close attention when giving feedback to students and teaching them how to correct writing errors in English. Based on the findings of the present study, it is difficult to argue that online grammar checkers can replace teachers when it comes to providing writing feedback. It is the responsibility of teachers to teach their students grammar, to point out common errors in English writing, and to give feedback on their writing so that their students can write in English correctly.

In conclusion, the present study has aimed to identify common syntactic errors made in English writing by undergraduates majoring in English and English for Careers, as well as investigating the reasons for these errors. Additionally, it has evaluated the effectiveness of an online grammar checker in improving English writing. The text adheres to the six-step error analysis method. The methodology proposed by Gass *et al.* (2013) was used which involved data collection, the identification, classification, and quantification of errors made, the investigation of the causes of the errors, and their remediation. In answer to research question 1, spelling errors were the most common, followed by errors in verb form, fragments, and capitalisation. As for research question 2, it is shown that the mistakes made were interlingual errors caused by L1 transfer. The effectiveness of an online grammar checker in detecting and correcting syntactic errors was then evaluated to answer research question 3. The results indicate that using an online grammar checker and being aware of errors improved the writing skills of the students majoring in English for Careers but not those of the English majors. Based on the results of the generalised mixed effects logistic regression, the impact of Phase 2 indicated a tendency to use 'with errors' among students.

According to the findings of the present study, it is theoretically possible that Thai English learners' English writing is greatly influenced from L1 transfer. These differences should be the focus of classroom discussion for both teachers and students. Language teachers should look for the

pedagogical value of errors. Interlingual errors can be used by writing teachers to measure their students' progress towards a goal and to identify areas that still need work (Corder, 1981). Teachers can also examine their students' errors to identify areas for improvement. Consequently, one of the core competences of a teacher is the ability to recognise and correct errors (Erdogan, 2005). Students' awareness of their errors is emphasised in the second implication. Therefore, writing teachers should teach their students about errors and the basics of learning an L2. One pedagogical strategy is to make students more aware of their errors and can prevent errors. In addition, students should be taught that making errors is a normal part of learning a language and that overcoming them takes time, patience, and effort (Ferris, 2002).

Technology will undoubtedly become a helpful approach in encouraging students to improve their writing ability if they properly evaluate and decide to accept the program's corrections. It is thus recommended that, if recommending students to use an online grammar checker to help with their writing, teachers should also assume an active role. When students utilise any such tools or applications, teachers still have to supervise their progress. It is thus the teacher's role to adopt, alter, or even create corrective procedures and strategies that can reduce writing mistakes and improve writing performance.

In relation to the study's recommendation, the same dataset may be utilised in the future to assess other grammar-checking applications. In addition, the performance of the free version of Ginger was assessed because the purpose was to analyse a free and open source grammar checking application. Next, larger dataset of this nature could be subjected to further analysis. The limitations of the present study include that the utilisation of the free version of Ginger prevents full access to important functions. It may therefore be pointed out that purchasing the premium version allows all of the program's important features to be used and the highest quality service to be received. Another limitation is that students are required to write in English by hand on test papers without the use of technology, even after learning how to utilise an online grammar checker to detect and correct errors. This ultimately results in the inability to prevent spelling errors.

### **Acknowledgements**

The completion of the present study would not have been possible without the assistance and funding of Suratthani Rajabhat University. I am indebted to Asst. Prof. Dr. Parussaya Kiatkheeree, Asst. Prof. Dr. Rungsima Jeanjaroonsri, and Asst. Prof. Dr. Sarawut Na Phatthalung for their invaluable assistance and guidance in the field of language during the course of this

project. I am also grateful to Dr. Chittraporn Chuthong for her insightful counsel. I would like to express my gratitude to all of the volunteers who participated in this study with such enthusiasm. Furthermore, I would like to express my gratitude to them for their linguistic assistance and for their tolerance as we worked through any difficulties or annoyances that may have arisen. Finally, I would like to express my gratitude to my family for their unwavering love, support, and belief in me.

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